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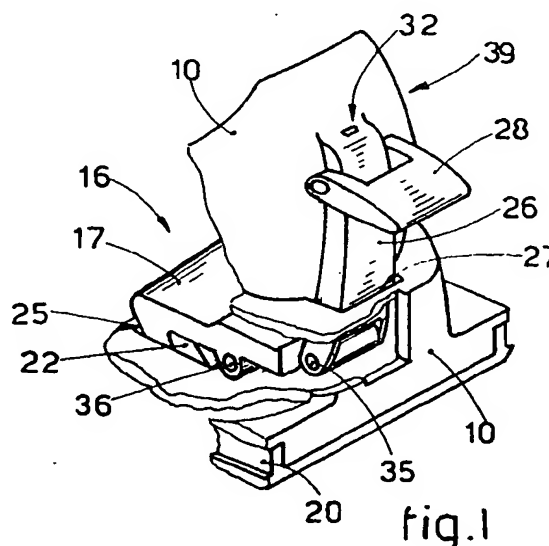
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**I-33100 Udine (IT)**(54) **Shoe/ankle-boot system with quickly replaceable sole element.**

(57) Shoe/ankle-boot system with quickly replaceable sole element, the shoe/ankle-boot system advantageously comprising a removable inner lining shoe, whereby in the lower part of the shoe/ankle-boot system (10) and in the upper part of the sole (20) are comprised reciprocal mating anchorage means (12-14-114-18) and reciprocal clamping assembly means (16) associated with actuation means, the reciprocal clamping assembly means (16) being located in a wholly protected area, the actuation means being positioned at the rear of the shoe/ankle-boot system (10) in an area for the most part protected, the reciprocal clamping assembly means (16) comprising an erection (22) in the upper part of the sole (20) and a spring catch (17) in the lower part (11) of the shoe/ankle-boot system (10), the spring catch (17) being able to move perpendicularly to that lower part (11) and being resiliently (34) held in its working position and being associated with actuation means and safety means.

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This invention concerns a shoe/ankle-boot system with a quickly replaceable sole element according to the main claim.

To be more exact, this invention concerns a shoe/ankle-boot system which advantageously, but not necessarily, includes an inner removable lining shoe of the type used with skiing boots and also a replaceable sole element.

The soles which can be fitted to this shoe/ankle-boot system are normal soles or specially made soles.

The state of the art covers shoe/ankle-boot systems which include a removable inner lining shoe and a replaceable sole element.

A shoe/ankle-boot system has been disclosed which consists of a thermal-resistant material and comprises a removable inner lining shoe and a replaceable sole element.

Two sole elements are provided, of which one is equipped with a skate for ice skating, while the other includes a plurality of rollers for use on the road in imitation of ice skating.

This ankle-boot of the state of the art entails the drawback that the sole elements in their two special forms are connected to the ankle-boot by means of screws; this involves many drawbacks such as the long replacement times, the need for tools to tighten and unscrew the screws, the risks of blockage of the screws owing to the infiltration of water and/or ice, the risks of excessive pressure by the head of the screws with resulting breakages or micro-cracks in one or another plastic part, the necessity to remove the shoe or ankle-boot from the foot so as to carry out the replacement, etc.

Moreover, the structure of the sole element has been specifically designed for the task to be performed and does not permit applications of other different equipment.

A system has also been disclosed which provides a shoe/ankle-boot system with a quickly replaceable sole element, the shoe/ankle-boot system including advantageously a removable inner lining shoe and being characterised in that in the lower part of the shoe/ankle-boot system and in the upper part of the sole there are reciprocal mating anchorage means and reciprocal clamping assembly means which can be quickly released from each other from the outside.

This system, although excellent, entails difficulties of actuation and can be at least momentarily obstructed by the cold and by ice.

Moreover, the systems of the state of the art do not provide a system providing safety against release.

The present applicants have designed, tested and embodied this invention to overcome the shortcomings of the state of the art and to be able to widen the field of use of the shoe/ankle-boot sys-

tem in question.

The shoe/ankle-boot system with a removable inner lining shoe and with a quickly replaceable sole element according to the invention is set forth and characterised in the main claim, while the dependent claims describe variants of the idea of the embodiment.

According to the invention the basic element of the shoe or ankle-boot consists of a rigid or semi-rigid material and includes along the length of its lower part guide means which cooperate with mating guide means included in the upper part of the replaceable sole.

These reciprocal guide means have the purpose at least of providing correct lengthwise and lateral reciprocal positioning as between the shoe/ankle-boot and the replaceable sole and also of achieving a bond that works on a plurality of axes.

According to the invention a quick-actuation reciprocal clamping and release assembly is included in cooperation with the guide means and comprises an erection in the upper part of the sole and a spring catch in the lower part of the shoe/ankle-boot system.

The spring catch is kept resiliently in the anchorage position and includes in its front portion an inclined plane which cooperates with a mating inclined plane comprised in the erection.

The spring catch is able to oscillate and is associated with actuation means which protrude from the rear of the shoe/ankle-boot.

The actuation means are equipped with safety means to prevent release.

The fact that the actuation means are positioned at the rear of the shoe reduces to a minimum the danger that they might be actuated accidentally.

Moreover, the inclusion of safety means provides an additional assurance.

Next, the inclusion of a rear protective screen has the effect that the means to prevent accidental actuation provide a very great assurance.

The actuation means have a clamping position and an actuation position.

The attached figures are given as a non-restrictive example and show a preferred embodiment of the invention as follows:-

Fig.1

is a partial three-dimensional view of the rear portion of a shoe/ankle-boot system according to the invention;

Figs.2a, 2b and 2c

are three-dimensional views of three pivotal elements of the invention;

Figs.3a and 3b

show vertical cross-sections of an embodiment of the invention in a released position (Fig.3a)

and in a clamped position (Fig.3b).

The reference number 10 in the figures denotes generically a shoe/ankle-boot system, while the reference number 11 indicates the lower part 11 of the shoe/ankle-boot 10, which in this case includes lengthwise positioning and guiding elements 12.

The shoe/ankle-boot system 10 comprises at its front end a frontal retaining prong 13.

The lengthwise elements 12 include guides 14, which are positioned at the two sides of the lower part 11 of the system 10 and include end-of-travel abutment means 15 at their rear end.

With that lower part 11 cooperates a reciprocal clamping assembly 16 with a spring catch 17, which is secured so as to be able to oscillate on first pivots 36 in supports 24 and includes at its front end an inclined plane 25 with anchorage teeth 37.

The clamping assembly 16 comprises a transmission lever 26 secured so as to be able to oscillate on a second pivot 35 on the spring catch 17 and cooperating with a hollow 27 in the rear side 39 of the shoe/ankle-boot system 10.

The hollow 27 together with a protective screen 38 has the task of protecting the actuation means, which thus remain for the most part in a strongly protected area.

The transmission lever 26 is secured so as to be able to oscillate at its other end in relation to a clamping lever 28.

A third pivot 29 which connects the transmission lever 26 and the clamping lever 28 can slide in a slot 30 within a protrusion 31 at the rear of the shoe/ankle-boot system 10.

The protrusion 31 includes in its upper portion an anchorage tooth 32, which cooperates with an anchorage seating 33 in the clamping lever 28. The anchorage tooth 32 and anchorage seating 33 form the safety means to prevent release.

A resilient spring 34 acts on the spring catch 17 to keep the latter normally retained.

A replaceable sole is generically indicated with the reference number 20; the sole 20 in this case includes lateral strips 18 which comprise mating guide means 114 with lateral guides 19.

These mating guide means 114 together with the relative lateral guides 19 mate with guides 14 included in the lower part 11 of the shoe/ankle-boot system 10. This arrangement creates a stable lateral and vertical anchorage with a secured seal engagement.

The replaceable sole 20 in this case comprises at its front end a tooth 21, which has the purpose of positioning and retaining vertically a frontal prong 13, thus creating a rigid reciprocal connection.

Moreover, the frontal and lower profile of the tooth 21 mates with the profile of the frontal part of the shoe/ankle-boot system 10 in making stable and safe the connection in the lengthwise direction too.

The replaceable sole 20 comprises tooth an erection 22 with an inclined plane 23 in consistent cooperation with the spring catch 17.

The replaceable sole 20 can be slid lengthwise into and out of engagement from the front; the spring catch 17 is in an inner protected position, while the actuation means of the reciprocal clamping assembly 16 are positioned at the rear of the shoe/ankle-boot system 10 in a strongly protected area.

Even an accidental release of the anchorage seating 33 from the anchorage tooth 32 would not create any danger owing to the action of the resilient spring 34 to assist anchorage.

The replaceable soles 20 can be variously specially embodied as shown in IT UD91A000065.

Thus, it is possible to have skiing soles, ice skating soles, soles with skating wheels for training, roller skating soles for training, soles for skating on the road (not shown), soles with their lower side made of rubber for walking, etc.; the sole 20 is of one type only and unchanging and it is only its special lower equipment which varies.

This special equipment is positioned in an ample connecting area which can be readily adapted to the special equipment involved and to the specific technical and functional requirements of that equipment.

Thus, other special equipment for the sole 20 is possible, so that it becomes easy for a user to equip the sole according to his personal and momentary requirements owing to the speed and great ease of installing and dismantling the system applied.

Figs.3 show the method of working of the reciprocal clamping assembly 16 or actuation assembly.

When the clamping lever 28 is in its raised position and is thus anchored (Fig.3b) by its anchorage seating 33 to the anchorage tooth 32, the spring catch 17 is clamped in a stable manner in cooperation with the erection 22, and the sole 20 cannot be slid out of engagement.

When (Figs.1 and 3a) the clamping lever 28 is released from the anchorage tooth 32 and when the sole 20 is slid into position, the inclined plane 23 of the sole 20 acts on the inclined plane 25 of the spring catch 17, raises the spring catch 17 and enables the spring catch 17 to pass over the erection 22 and to be anchored thereto owing to the effect of the spring 34.

When it is desired to release the sole 20, it is enough to thrust the clamping lever 28 downwards,

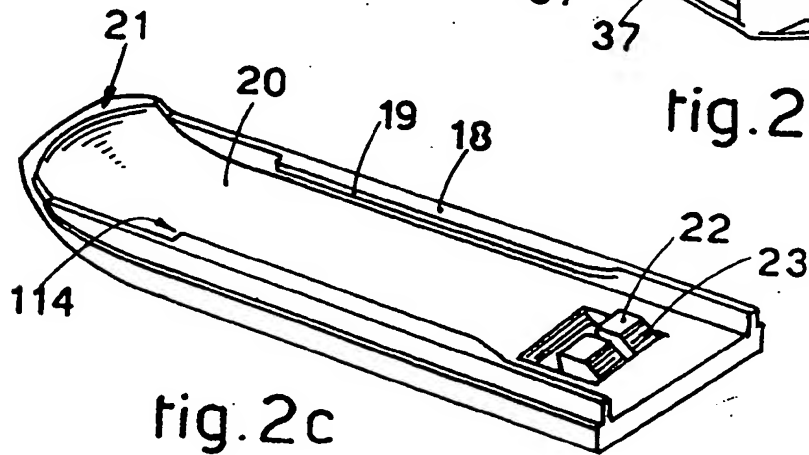
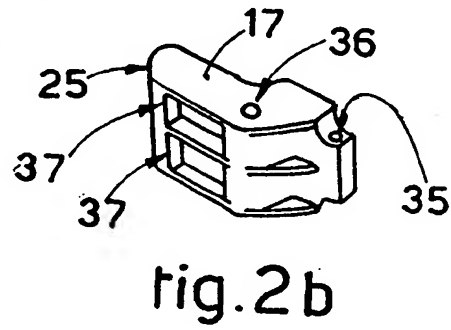
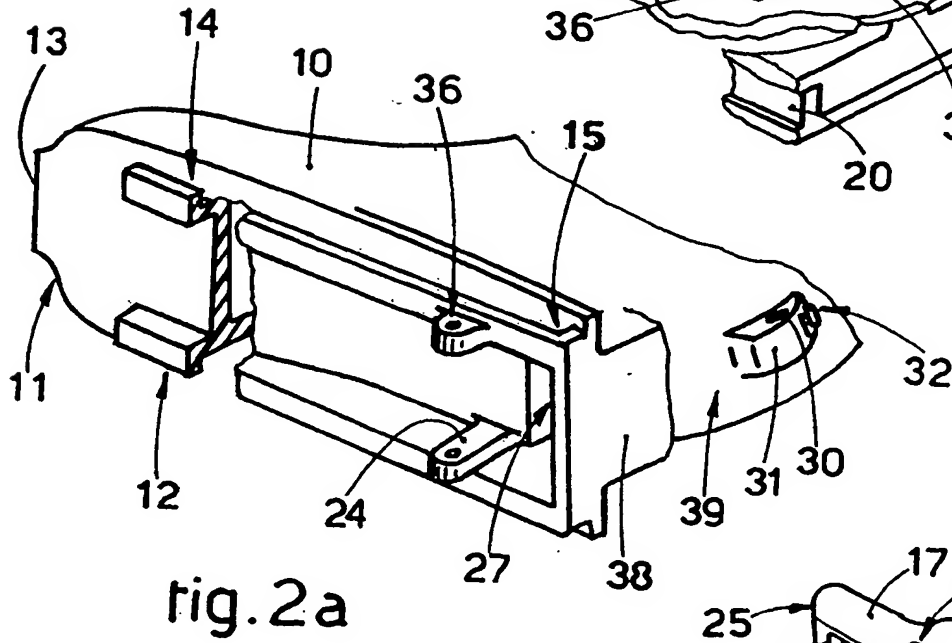
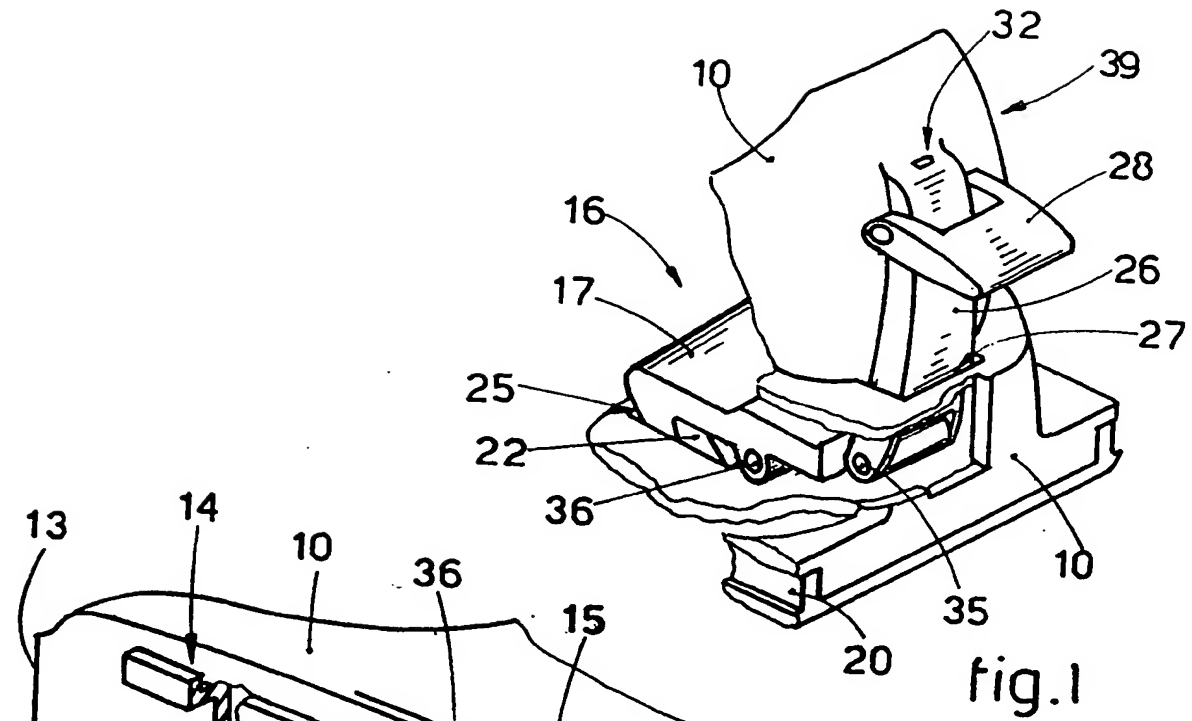
thus overcoming the action of the spring 34 and releasing the erection 22 (Fig.3a) so that the sole 20 can be slid out of engagement.

It should be noted that the hollow 27 includes a protective screen 38 which has the purpose of protecting the outer part of the reciprocal clamping assembly 16, so that the greater part of the attachment means and actuation means are positioned in a protected area screened from the outside.

The fact that the actuation means are at the rear of the shoe/ankle-boot system 10, the inclusion of the spring 34, the protective screen 38 and the anchorage safety means 32-33 make the device safe and reliable in any working conditions.

### Claims

1. Shoe/ankle-boot system with quickly replaceable sole element, the shoe/ankle-boot system advantageously comprising a removable inner lining shoe, whereby in the lower part of the shoe/ankle-boot system (10) and in the upper part of the sole (20) are comprised reciprocal mating anchorage means (12-14-114-18) and reciprocal clamping assembly means (16) associated with actuation means, the system being characterised in that the reciprocal clamping assembly means (16) are located in a wholly protected area, and the actuation means are positioned at the rear of the shoe/ankle-boot system (10) in an area for the most part protected, and in that the reciprocal clamping assembly means (16) comprise an erection (22) in the upper part of the sole (20) and a spring catch (17) in the lower part (11) of the shoe/ankle-boot system (10), the spring catch (17) being able to move perpendicularly to that lower part (11) and being resiliently (34) held in its working position and being associated with actuation means and safety means.
2. System as in Claim 1, in which the sole (20) comprises at its frontal end a tooth (21) cooperating with a mating frontal prong (13) included at the front of the shoe/ankle-boot system (10).
3. System as in Claim 1 or 2, in which the reciprocal clamping assembly means (16) comprise support means (24) protruding from the lower part (11) of the system (10) and containing holes (36) for the pivoting of the spring catch (17).
4. System as in any claim hereinbefore, in which the actuation means comprise a transmission lever (26) extending vertically outside the rear of the shoe/ankle-boot system (10) and anchored to the spring catch (17) in such a way as to be able to oscillate.
5. System as in any claim hereinbefore, in which the transmission lever (26) cooperates with a hollow (27) and with a protective screen (38) extending vertically at the rear of the shoe/ankle-boot system (10).
6. System as in any claim hereinbefore, in which the transmission lever (26) is associated in an oscillatory manner with a clamping lever (28) including an anchorage seating (33) cooperating with an anchorage tooth (32) solidly fixed to the rear (39) of the shoe/ankle-boot system (10), the anchorage seating (33) and anchorage tooth (32) constituting the safety means.
7. System as in any claim hereinbefore, in which the anchorage tooth (32) is solidly fixed to a protrusion (31) extending upwards at the rear (39) of the shoe/ankle-boot system (10).
8. System as in any claim hereinbefore, in which the protrusion (31) contains a slot to contain and guide a pivot (29) providing oscillatory connection between the transmission lever (26) and clamping lever (28).
9. System as in any claim hereinbefore, in which the erection (22) includes a plane (23) inclined in the direction of insertion of the sole (20).
10. System as in any claim hereinbefore, in which the spring catch (17) includes at its frontal end an inclined plane (25).



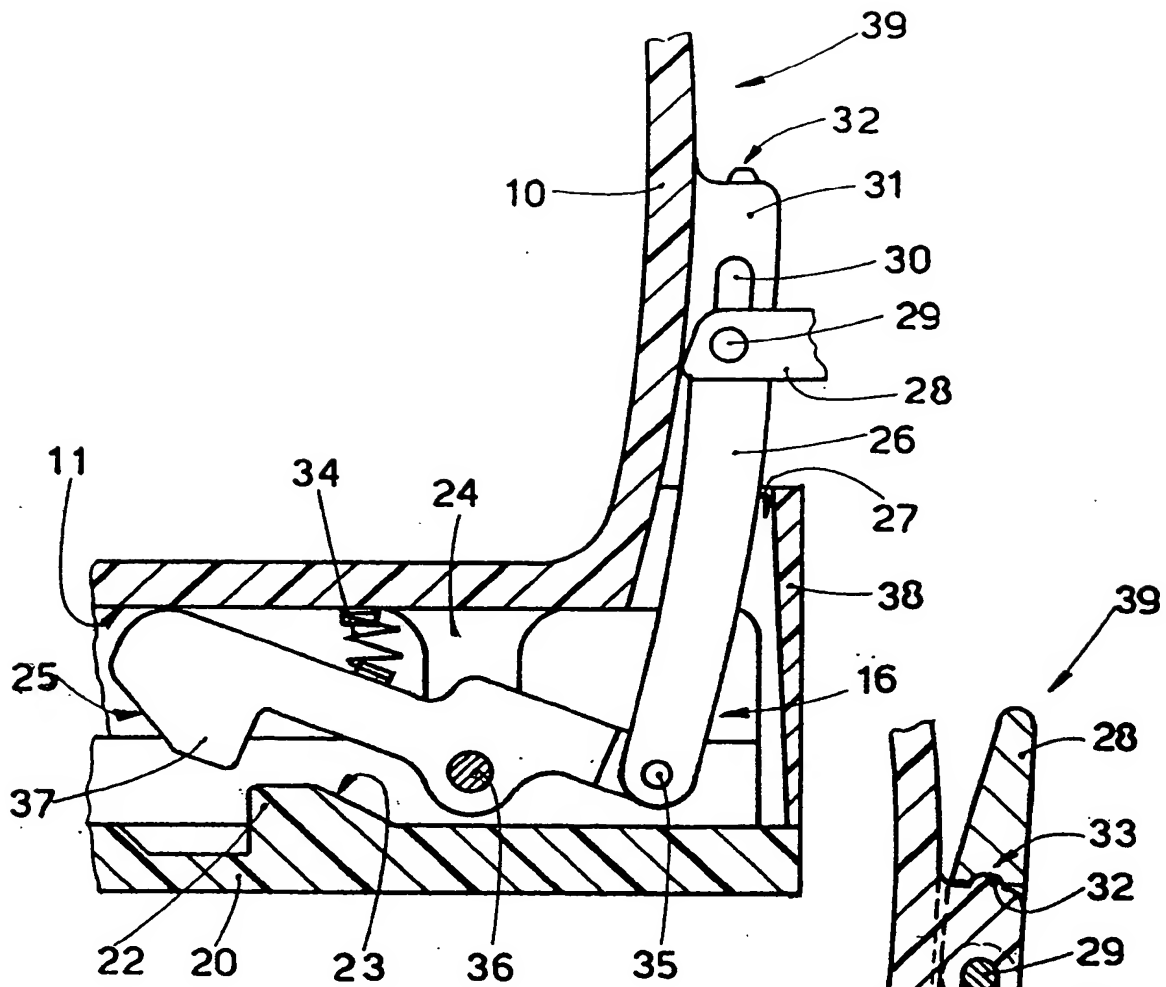


fig. 3a

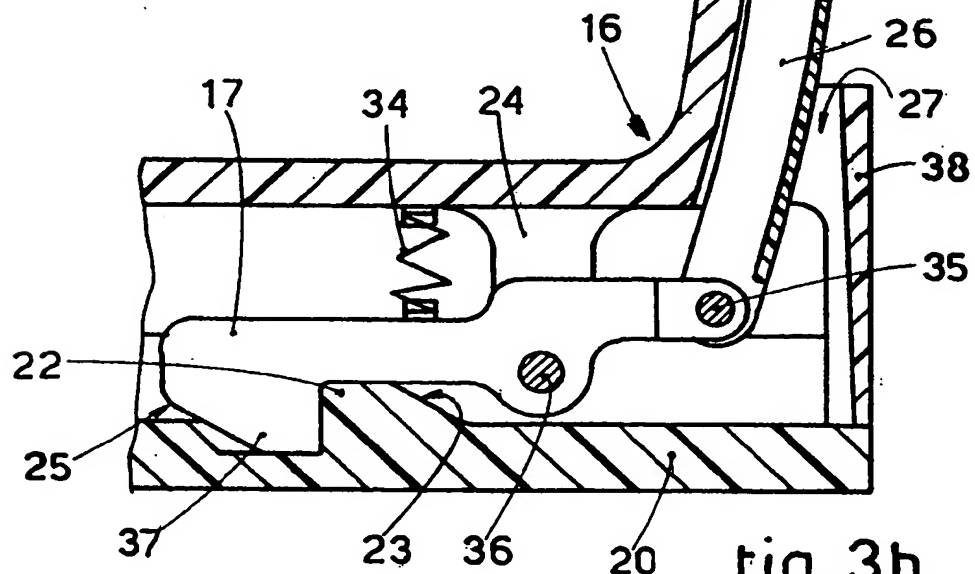


fig. 3b



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## EUROPEAN SEARCH REPORT

Application Number  
EP 94 11 3255

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
D,A	EP-A-0 510 384 (CALZATURIFICIO DAL BELLO SRL) * column 4, line 20 - column 5, line 4; figures *	1-10	A43B13/36 A43B5/04
A	DE-A-18 11 135 (GÖTZ) * page 2, paragraph 2 * * page 4, paragraph 2; figures 2,5 *	1-10	
A	FR-A-2 295 768 (MITCHELL) * claims 1,4; figures *	1-10	
A	US-A-4 420 894 (GLASSMAN) * column 3, line 3 - line 17 * * figures 6,7 *	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			A43B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 2 December 1994	Examiner Scholvinck, T
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons A : member of the same patent family, corresponding document	

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